

Transportation. As of 1 September 1993, 28,617 acres of the Roanoke floodplain are owned by public and private conservation agencies. Following the completion of the current acquisition plan by Joint Venture Partners, a total of 53,000 acres will be under public protection.

COMMITTEE'S LONG-TERM RECOMMENDATION. The Committee recommended to the WRC that the present experimental flow regime be expanded by two weeks, to cover the dates 1 April through 30 June of each year. This extended flow regime would be continued for the next six years, 1994 through 2000, at which time the Federal Energy Regulatory Commission license expires and other flow alternatives, as described below, may be recommended. The Committee asked the WRC to stress to the Corps that the target flows during the expanded spawning window be the average daily flow values, rather than the upper and lower boundaries. The Committee also continued to recommend that the hourly variation in flow not exceed 1,500 cfs. The Committee further recommended to the WRC that it encourage the Corps and Virginia Power to consider a new annual (12-month) flow regime based on pre-impoundment (natural) flow conditions.

HEAVY METAL CONTAMINANTS. All 15 trace elements analyzed in this study are substantially enriched within bottom sediments at one or more sites in the vicinity of known point source discharges within the lower Roanoke and lower Chowan rivers and inner Albemarle Sound areas. Most sequestered trace elements are loosely bound to fine-grained sediments and consequently are potentially available to filter- and bottom-feeding organisms. Anthropogenic sources are largely responsible for trace element contamination within the sediments. NPDES permitted discharges appear to be the major contributors to enriched trace elements to bottom sediments. Nonpoint sources are also important, but are more diffuse and difficult to evaluate. Six areas of concern were identified: Welch Creek, inner Albemarle Sound, lower Roanoke River, Middle River, Cashie River, and lower Chowan River. Welch Creek is the most contaminated, but the problem appears to be relict.

HYDROLOGY. Flows during the period April through mid-June, 1991 were the 18th wettest on record. For this period, daily flows were within the flow regime 68% of the time. River flows during the period April through mid-June, 1992 were the 30th wettest on record. Daily flows from 1 April through 15 June were within the recommended flow regime 45% of the time. During 1993 spring flows were the 3rd wettest on record for April through mid-June. Flows exceeded the recommended upper flow boundary 54% of the time, and were within the upper and lower flow boundaries 46% of the time.

TIME SERIES ANALYSES. The extreme wet conditions of the early spring of 1991 resulted in so much water being stored that the outflow overwhelmed any pattern which might have been observed. The 1991 result was not consistent with findings in previous years; however, these results were consistent with the finding in the first report that bad spawning years are characterized by either very high or very low flows throughout the spawning season. Overall, the flows for 1992 were unstable due to significant rains during the spring. In terms of the models, the ARIMA models without the intervention variables were a random walk for the entire period (March through June) and similar to the models for other years for the Negotiated Period (1 April - 15 June). The model for the Negotiated Period had a positive AR1 parameter, indicating little day-to-day variation in flows. In the autoregressive analysis of the 1993 flows, significant monthly and daily coefficients in the models for daily data were conspicuous by their absence. Only in the daily model for the entire period were there significant coefficients which were not AR coefficients.

KERR RESERVOIR OPERATIONS IN HINDSIGHT. From a data collection standpoint, it was unfortunate that the entire five-year flow regime was relatively wet. Evaluating the Negotiated Flow Regime during drier times is needed.